UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

before the

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	Docket Nos. 50-445-OL
	)	50-446-OL
TEXAS UTILITIES ELECTRIC COMPANY et al.	)	
	)	
	)	(Application for an
(Comanche Peak Steam Electric Station, Units 1 and 2)	)	Operating License)
	)	

AFFIDAVIT OF R. P. KLAUSE

I, R. P. Klause, being duly sworn under oath, state as follows:

1. I am employed by Stone & Webster Engineering Corporation as an Engineering Manager and have acted as the Project Manager for the Pipe Stress Analysis and Support Project at Comanche Peak Steam Electric Station ("CPSES"). A description of my educational background and engineering experience is attached. As Project Manager, I had overall responsibility for Stone & Webster's activities in performing the design validation for large and small bore piping and pipe supports at CPSES including the preparation of the Project Status Reports ("PSR").

2. The PSRs on large and small bore piping and pipe supports attached hereto are true and correct copies of the PSRs prepared

by Stone & Webster and accurately summarize the design validation process undertaken by Stone & Webster and the results of that process.

3. The matters set forth above are based on my personal knowledge and are true and accurate to the best of my knowledge and belief.

R. P. Klause

R. P. KLAUSE

Subscribed and sworn to before me this 6th day of May, 1988.

Robert C. Shannon

Notary Public

My Commission expires on 5-22-89.

ROBERT C. SHANNON
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires 5-22-89

May 1988

KLAUSE, RONALD P.

ENGINEERING MANAGER
ENGINEERING GENERAL
DIVISION

EDUCATION

Northeastern University - Associate of Science, Structural Engineering - Bachelor of Science, Industrial Technology - 1972
Northeastern University - Management Development Program - 1986

LICENSES AND REGISTRATIONS

Professional Engineer - Delaware and New Jersey

EXPERIENCE SUMMARY

Mr. Klause is an Engineering Manager at Stone & Webster Engineering Corporation's Cherry Hill office. This office is involved with nuclear and fossil power and industrial projects and employs 1,500 people. In August of 1985, Mr. Klause was given a special assignment as the Project Manager for the Pipe Stress Reconciliation Project for the Comanche Peak Steam Electric Station. In this capacity he is responsible for the management of a comprehensive piping and pipe support reanalysis effort which requires the development of design criteria and procedures which addresses and resolves technical issues identified by external sources, and the defense of the results in the licensing process.

Since joining Stone & Webster Engineering Corporation in 1969, he has been assigned as Assistant Engineering Manager, Division manager of the Engineering Mechanics Division, Supervisor of the Pipe Stress Analysis and Support Section, and Lead Stress Engineer for boiling water and pressurized water reactor plants. Special assignments have included membership in the Mark II Containment Owners Committee, a working committee of all BWR Mark II owners and their supporting AEs to define the magnitude of the Mark II Suppression Pool hydrodynamics problem and to coordinate interutility communication with respect to the resolution of related technical and licensing issues. Additionally, he served as Project Manager for the Public Service Electric and Gas Company, Salem Units 1 and 2 Projects to implement the requirements of IE Bulletins 79-02, 79-07, and 79-14. In the 19 years Mr. Klause has been employed at Stone & Webster, he has performed engineering tasks on 13 nuclear units including Surry 1 and 2, James A. FitzPatrick, Maine Yankee, Connecticut Yankee, Beaver Valley 1, Nine Mile 2, River Bend, Enrico Fermi II, Salem 1 and 2, and Comanche Peak 1 and 2.

Prior to joining Stone & Webster Engineering Corporation, Mr. Klause had experience in the design of highway and railroad bridges, commercial warehouses, and pipe support structures for chemical processes and petrochemical plants.

RPK

PROFESSIONAL AFFILIATIONS

Delaware Society of Professional Engineers - Member

DETAILED EXPERIENCE RECORD
KLAUSE, RONALD P. 49345

STONE & WEBSTER ENGINEERING CORPORATION, CHERRY HILL, NJ (June 1973 - Present)

Appointments:

Engineering Manager - Aug 1985
Assistant Engineering Manager - Feb 1980
Division Manager - Oct 1975
Supervisor - June 1973
Power Engineer - Sept 1972

General Engineering (Aug 1985 - Present)

As ENGINEERING MANAGER, assigned as Project Manager for Comanche Peak Steam Electric Station, a project involved in resolving multiple technical issues for requalifying all ASME safety class piping and supports.

General Engineering (Feb 1980 - July 1985)

As ASSISTANT ENGINEERING MANAGER, Mr. Klause's assignments have provided him with diversified management skills, experience and expertise in forecasting and budgeting for the Engineering Department, training, productivity improvement, engineering assurance, and marketing strategies. he also coordinated the development of engineering - construction proposals and their estimates. His duties also included being the Engineering Department sponsor on a 425MW coal-fired power plant project, oil to coal conversion, and conceptual design of a coal-water mixture manufacturing facility, where he was responsible for oversight of all phases of engineering.

Engineering Mechanics Division (Oct 1975 - Feb 1980)

As DIVISION MANAGER, responsible for the overall technical and administrative guidance to all engineering and design personnel assigned to the Engineering Mechanics Division; reported to the Engineering Manager.

Pipe Stress Analysis and Support Section, Power Division (June 1973 - Oct 1975)

As SUPERVISOR, responsible for the overall technical and administrative guidance to all engineering and design personnel assigned to these disciplines.

Nuclear Reactor Plants (Nov 1969 - June 1973)

As LEAD PIPE STRESS ENGINEER, worked on pressurized water reactor plants and boiling water reactor plants, responsible for pipe stress analysis, coordinating field construction of pipe restraints with project engineering and design, developing criteria and performing seismic analysis of field run pipe, and developing preoperational thermal expansion test procedures associated with hot functional testing.

RPK

THOMAS K. DYER, INCORPORATED, CONSULTING ENGINEERS, LEXINGTON, MA
(Feb 1968 -April 1969)

As STRUCTURAL DESIGNER, responsible for design of a two-track simple span deep girder railroad bridge in Pittsfield, MA. Also was responsible for checking the design of a hydraulic scheme for water removal from a railroad tunnel under the Welland Canal. From November 1968 to January 1969, performed a feasibility study of a high-speed turbo train between Boston and New York involving new alignment versus existing, and establishing cost estimates and time tables for each.

THE BADGER COMPANY, CAMBRIDGE, MA (Feb 1966 - Feb 1968)

As PIPE SUPPORT DESIGNER, responsible for the design of pipe supports and checking piping flexibility for several major oil and chemical companies.

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MA (Jan 1965 - Feb 1966)

Appointments:

Draftsman

As DRAFTSMAN, responsible for layout and design of pipe supports and checking piping flexibility for the Bombay Petrochemical Complex, Bombay, India, and for the Shell Oil Company, Norco, LA.

HOWARD, NEEDLES, TAMMEN, & BERGENDOFF, CONSULTING ENGINEERS, BOSTON, MA
(Nov 1968 - Jan 1965)

As DRAFTSMAN, responsible for detailing various parts of highway bridges and field inspection of the Massachusetts Turnpike.

U.S. ARMY (Oct 1960 - Oct 1963)

RADIO OPERATOR - SECURITY

INDUSTRIAL INSULATORS, INCORPORATED, BORGER, TX (1957 - 1960)

As SUMMER EMPLOYEE for three summers, was responsible for applying insulation to pipes and vessels on the following project: High Energy Rocket Fuel Plant, Muskoogee, OK; Keyes Helium Plant, OK; Philblack Carbon Black Plant, Borger, TX; and Phillips Petroleum Plant, Phillips, TX.

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(Comanche Peak Steam Electric Station, Units 1 and 2)	)	Operating License)

AFFIDAVIT OF J. W. MUFFETT

1. I am employed by Texas Utilities Electric ("TU") as the manager of the Civil Engineering in the Engineering Department at Comanche Peak Steam Electric Station ("CPSES"). A copy of my professional qualifications is attached hereto. As the manager of the Civil Engineering, I am responsible for providing management direction, oversight and coordination of safety-related civil, pipe stress and pipe supports, cable tray hanger, conduit and HVAC supports design performed by the engineering contractors, such as Stone & Webster Engineering Corporation ("SWEC"). In addition, I am the primary technical liaison with Cygna Energy Services ("Cygna") on such matters.

2. The Review Issues Lists ("RIL") on Pipe Stress and Pipe Supports attached hereto are true and correct copies of the most current such RILs issued by Cygna. The attached RILs document that all of the issues on Cygna Pipe Stress and Pipe

Support Review Issue Lists have been resolved to the satisfaction of Cygna and have been closed by Cygna. In addition, at a public meeting in Glen Rose, Texas on May 19, 1987, Cygna stated that all pipe stress and pipe support issues were closed.

3. As noted above, my responsibilities include management and oversight of the engineering and design activities of the engineering contractors. In that role, I have been continuously involved in the management oversight of the design validation process of large and small bore piping and pipe supports performed by SWEC including the preparation of the Project Status Reports on piping and pipe supports. Based on my involvement with SWEC and my review of the Project Status Reports, I agree with the methodology employed and the conclusions reached by SWEC. In particular, I agree that the design validation of large and small bore piping and pipe supports accomplished the following:

(a) Resolved all design-related external source issues, including issues raised by Messrs. Doyle and Walsh, Cygna and the Board;

(b) Resolved all CPRT identified design-related issues;

(c) Resolved all CAP identified design-related issues;

(d) Prescribed the corrective and preventive actions necessary to resolve issues (a), (b) and (c);

(e) Assured that all calculations and drawings related to piping and pipe supports are validated;

(f) Assured that the validated design is reflected in the validated calculations and drawings;

(g) Assured that the piping and pipe support hardware installation specifications, construction procedures and quality control inspection procedures are validated and contain the requirements necessary to assure hardware compliance with the validated design; and

(h) Assured that the validated design complies with CPSES licensing commitments.

4. The matters set forth above are based on my personal knowledge and are true and accurate to the best of my knowledge and belief.

_____

J.W. Muffett

Subscribed and sworn to before me this ___ day of May, 1988.

_____

Notary Public

My Commission expires on _____.

RESUME OF JAMES W. MUFFETT

916 CANYON
CLEBURNE, TEXAS 76031
OFFICE PHONE: (817) 897-6956
HOME PHONE: (817) 556-3462

EDUCATION:

Graduate B.S. in Physics 1972, Purdue University

Graduate M.S. Mechanical Engineering 1978, University of Idaho

Registered Professional Engineer, State of Indiana, Illinois, Minnesota and Texas

SUMMARY OF PROFESSIONAL EXPERIENCE:

My professional experience basically involves the supervision, direction and application of advanced analytical techniques such as finite element analysis, finite difference techniques and specialized Fortran programming to a wide variety of engineering assignments. I have a broad background in areas involved with design, analysis and modification of both nuclear plants under construction and operating nuclear plants. These areas include welding; NDE; ASME Codes and Quality Assurance. I have also been an expert witness in the NRC licensing process and I have a general familiarity with the NRC licensing process.

In addition to these areas I have held supervisory and administrative positions over various groups performing analytical design and development tasks. I have also been active in part-time teaching at various colleges. Overall I believe that I have experience in both the management and the performance of advanced technical efforts.

EMPLOYMENT:

TU Electric — February, 1987 to Present
CPSES
P.O. Box 1002
Glen Rose, Texas 76043

Manager of Civil Engineering: This position is accountable for TU Electric's knowledge and performance of the design, licensing presentation, and operations supports of all matters relating to Civil and Structural qualification of CPSES through recruitment and training of engineering personnel, technical overview of engineering contractors, and the development and implementation of administrative and technical policies, practices and procedures. In addition, I reviewed and monitored the

Resume of James W. Muffett, P.E.

interactions of Contractors with Cygna, Tera and NRC. Products of these activities are qualified earthwork, geotechnical and seismic designs, reliable structures, and structurally qualified piping, pipe supports, electrical cable tray, conduit, ductwork, and instrumentation systems.

Prior to becoming Manager of Civil Engineering, I performed as L.D. Nace's Executive Assistant from February, 1987 until May, 1987.

USNRC Region III — August, 198[illegible] to January, 1987
799 Roosevelt Road
Glen Ellyn, Illinois

Chief of Plant System Section, Division of Reactor Safety (February, 1986 to January, 1987) and Reactor Inspector, Materials and Process Section, August, 1983 to February, 1986: These positions' responsibilities include direction of inspection and review of applicant's and licensee's activities concerning design, analysis, modification and construction of power reactors. As part of training, completed various NRC training programs (Welding Technology; NDE Technology; Construction Quality Assurance; In Service Inspection). Served as expert witness for the NRC at the Byron licensing hearing concerning various design and analysis issues. Also involved with review of engineering, evaluations of discrepant items of the Byron Reinspection program, the Braidwood Construction Assessment Program (BCAP) and the Clinton Overinspection program. Also act as a consultant to the Region concerning various codes (ANSI, B 31.1; ASME Section III and Section XI; AISC Manual of Steel Construction; AWS, D1.1) and relation of these codes to design and analysis.

Nutech Engineers — September, 1981 to August, 1983
303 East Wacker
Chicago, Illinois

Engineering Manager: This position's responsibilities included technical and administrative supervision of approximately 23 mechanical engineers performing analysis and design of piping systems and pipe supports for nuclear power station. Specific responsibilities included supervision of field "walk-downs," piping stress analysis (for both original design loadings and Mark I, hydrodynamic piping loads), piping support design and reconciliation of "as-built" conditions. Manager efforts at Dresden 2 & 3; Quad Cities 1 & 2; Enrico Fermi 2 and Monticello. Also developed an analysis method based on "in-situ" testing of piping systems. Responsible for efforts in non-linear finite elements analysis (primarily ADINA).

Resume of James W. Muffett, P.E.

International Harvester — March, 1980 to March, 1981
Components Group - Engine Division
10400 West North Avenue
Melrose Park, Illinois

Product Engineer-Design Analysis: This position's responsibilities included developing and instituting a series of advanced analytical methods for the analysis of engine components (piston, crankshaft, valves, etc.). These methods include Finite Element analysis, computer graphics, optimization techniques and non-linear analysis. Also, I was a member of the corporate Finite Element Analysis Committee.

Cummins Engine Co., Inc. — October, 1978 to March, 1980
1000 5th Street
Columbus, Indiana

Senior Engineer: This position's responsibilities included using advanced analytical techniques in the design and analysis of engine components primarily for the Case-Cummins joint venture engine.

E.G.&G. Idaho Inc. — July, 1975 to October, 1978
Box 1625
Idaho Falls, Idaho

Senior Engineer-Group Leader: This position's responsibilities included performing and directing ASME Section III piping analysis for various reactors located on the Idaho National Engineering Laboratory. Also in this position I coordinated activity with construction and project management group and also had responsibility for instituting and developing a new piping analysis method using an integrated computer program.

Sargent & Lundy Engineers — June, 1972 to June, 1975
55 East Monroe
Chicago, Illinois

Stress Analyst: This position's responsibilities included performing ASME Section III piping analysis, and development of simplified design and analysis procedures. Also in this position, I was assigned to job sites at nuclear power plants under construction at Zion and Fort St. Vrain. While on site, I acted as an interface between construction and analytical groups and also served on an "on-site" technical representative.

SUMMARY OF TEACHING EXPERIENCE

INPUT (Columbus Campus)

MET 210 Applied Statics (1979)

MET 200 Power Systems (1979)
(Thermal Engineering)

Resume of James W. Muffett, P.E.

MET 216 Machine Elements (1980)

MIDWEST COLLEGE OF ENGINEERING (Lombard, Illinois)

MA 53 Numerical Analysis (1982, 1983)

MA 52 Differential Equations (1983)